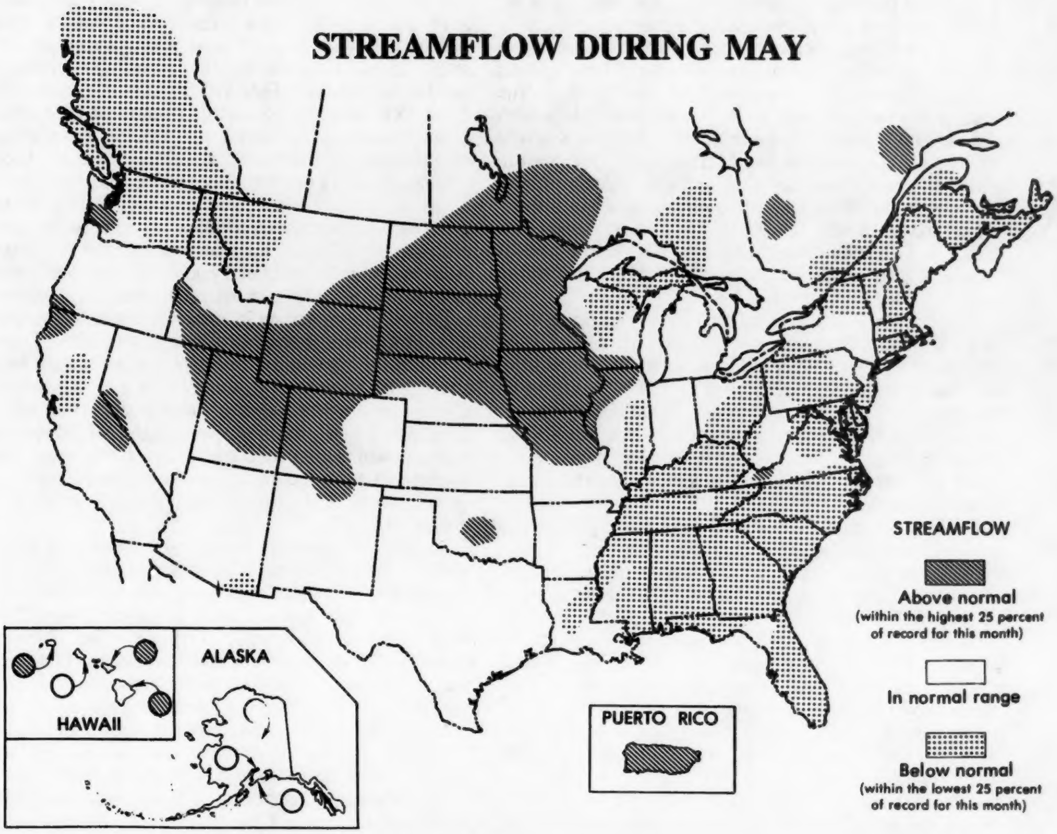
# National Water Conditions

UNITED STATES
Department of the Interior
Geological Survey

CANADA
Department of the Environment
Water Resources Branch

## MAY 1986




Both variability and persistence marked streamflow during May as precipitation across the United States varied widely. For example: streamflow went from above normal to below normal in parts of Ontario, Michigan, Wisconsin, Montana, and Arizona; streamflow went from below normal to above normal in parts of Washington, Oregon, California, and Virginia; record high flows for May occurred in the upper midcontinent, record low flows for May occurred in the East; parts of the United States were into their 5th year of above-normal streamflow, the rise of Utah's Great Salt Lake being one symptom of the phenomenon.

On May 30, eight people were killed, one person was missing, and damages were about $20 million after flooding in the area of Etna, Pennsylvania.

On June 1, 1986, Utah's Great Salt Lake stood at 4,211.80 feet above sea level, 0.20 foot higher than the 1873 record-high of 4,211.6 feet.

The combined flow of the 3 largest rivers in the lower 48 States—Mississippi, St. Lawrence, and Columbia—averaged 1,237,200 cfs during May, 20 percent below median, but 1 percent above last month.

Contents of 71 percent of reporting reservoirs were at or above average for the end of May. Only five reservoirs reported significant declines in contents during May and only two of those, International Amistad in Texas and Hungry Horse in Montana, had below-average contents for the end of May.

About 57 percent of the index stations in the United States and southern Canada had flows in the normal to above-normal range, compared with the 61 percent in these ranges for last month.

# STREAMFLOW CONDITIONS DURING MAY 1986

Both variability and persistence marked streamflow during May as precipitation across the United States (see map) varied widely. For example: record low precipitation for May (data from National Weather Service) occurred in Bridgeport, Connecticut (0.34 inches), Marquette, Michigan (0.07 inches), Phoenix, Arizona (0.00 inches), and several other locations, while San Angelo, Texas, had a record-breaking 7.28 inches; streamflow went from above normal to below normal in parts of Ontario, Michigan, Wisconsin, Montana, and Arizona; streamflow went from below normal to above normal in parts of Washington, Oregon, California, and Virginia; record high flows for May occurred in the upper midcontinent, record low flows for May occurred in the East (see table); parts of the United States were into their 5th year of above-normal streamflow (see page 6), the rise of Utah's Great Salt Lake being one symptom of the phenomenon. The four hydrographs on page 4 were chosen to highlight both the variability and persistence of flow conditions across the Nation. Smith River and Marias River have been in three different flow ranges in as many months; Crow River is in its 20th consecutive month of above-normal flow, and set a new record high for May; Contentnea Creek is in its 5th consecutive month of below-normal flow and set a record monthly low for May, as it did in April.

On May 20, the "Upriver Dam" on the Spokane River at the Spokane, Washington, city limits was breached by rising waters after a power failure during a thunderstorm on May 20. The dam gates were closed at the time and the spillway could not convey the 9,000 cubic feet per second (cfs) flow. Peak discharge after the breach was about 16,200 cfs at the Spokane River gaging station 4.5 miles downstream, 10,200 cfs less than the 1985 annual peak at that site.

On May 30, eight people were killed, one person was missing, and damages were about $20 million after flooding in the area of Etna, Pennsylvania. Little Pine Creek near Etna (drainage are 5.78 square miles) peaked at about 7,400 cfs (recurrence interval greater than 100 years) as a result of 7 inches or more of rain (National Weather Service bucket survey) in the headwaters area of the creek, over three times the previous record peak discharge (2,040 cfs in 1974).

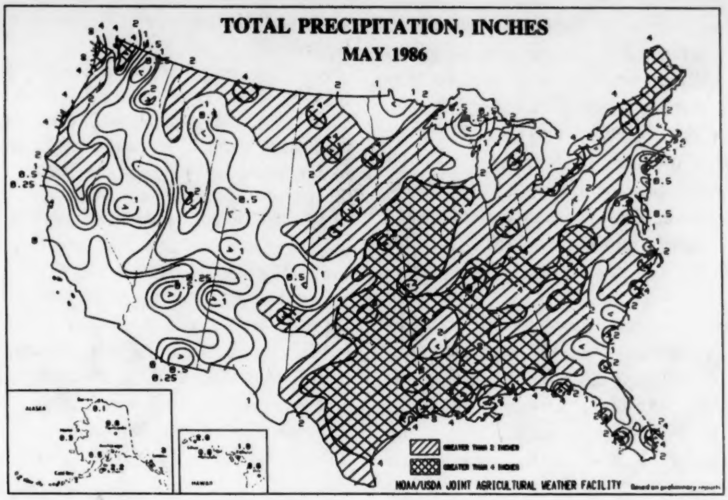
On June 1, 1986, Utah's Great Salt Lake stood at 4,211.80 feet above sea level, 0.20 foot higher than the 1873 record-high of 4,211.6 feet. Records of lake level began in 1847. The lake rose only 0.15 foot from May 15 to June 1, and the 0.5-foot rise recorded during May was the smallest monthly rise since January 1986. The National Weather Service revised the peak forecast to 4,212 feet based on the June 1 reading. (A dike breached on June 8 when the lake stood at 4,211.85 feet, and the combination of evaporation and flooding of the previously protected area dropped the lake elevation to 4,211.45 feet as of June 10.)

The combined flow of the 3 largest rivers in the lower 48 States—Mississippi, St. Lawrence, and Columbia—averaged 1,237,200 cfs during May, 20 percent below median, but 1 percent above last month. Discharges increased on the St. Lawrence River (4 percent) and the Columbia River (25 percent) from last month, somewhat more than offsetting the 9 percent decrease in flow of the Mississippi River. The combined flow of the three rivers and the individual flows of both the Mississippi and Columbia were in the below-normal range, but the flow of the St. Lawrence was 19 percent above median, in the above-normal range for the 16th consecutive month, and the 2nd highest May flow in 127 years of record. These three rivers account for runoff from more than half the conterminous United States and provide a useful check on the status of the Nation's surface-water resources.

Contents of 71 percent of reporting reservoirs were at or above average for the end of May. Only five reservoirs reported significant declines in contents during May and only two of those, International Amistad in Texas and Hungry Horse in Montana, had below-average contents for the end of May. In sharp contrast, 13 reservoirs reported both significant increases in contents during May and above-average contents for the end of May. Contents of Belle Fourche in South Dakota went from a below-average 62 percent of capacity at the end of April to an above-average 86 percent of capacity at the end of May. Contents of the Mississippi River headwater system reservoirs, which more than doubled last month to an above-average 44 percent capacity, again increased significantly to 53 percent of capacity, well above average for the end of May.

Streamflow generally decreased seasonally in Hawaii, Arizona, South Dakota, Minnesota, Missouri, Arkansas, Wisconsin, Illinois, Michigan, Ohio, Pennsylvania, New York, New England, New Brunswick, Nova Scotia, New Jersey, Maryland, Virginia, the Carolinas, Georgia, Florida, Alabama, and Tennessee, and decreased variably in Ontario and Nebraska. Flows changed variably in California, New Mexico, North Dakota, and Indiana, but remained unchanged in Nevada. Flows generally increased in the rest of southern Canada and the United States: seasonally in Quebec, Alberta, British Columbia, Iowa, Kansas, Oklahoma, Texas, Montana, Idaho, Wyoming, Colorado, Utah, and Alaska; contraseasonally in Saskatchewan, Oregon, Louisiana, Mississippi, Kentucky, and West Virginia; variably in Puerto Rico. About 57 percent of the index stations in the United States and

CONTENTS




## NEW EXTREMES DURING MAY 1986 AT STREAMFLOW INDEX STATIONS

| Station number | Stream and place of determination | Drainage area (square miles) | Years of record | Previous May extremes (period of record) | | May 1986 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Monthly mean in cfs (year) | Daily mean in cfs (year) | Monthly mean in cfs | Percent of median | Daily mean in cfs | Day |
| | LOW FLOWS | | | | | | | | |
| 01E0001 | St. Mary's River at Stillwater, Nova Scotia, Canada. | 52,311 | 71 | 678 (1960) | 187 (1960) | 597 | 35 | 299 | 23 |
| 01FB001 | Northeast Margaree River at Margaree Valley, Nova Scotia, Canada. | 142 | 70 | 463 (1983) | 286 (1983) | 252 | 15 | 139 | 31 |
| 01309500 | Massapequa Creek at Massapequa, NY. | 38 | 83 | 5.01 (1981) | 2.80 (1966) | 3.07 | 26 | 2.30 | 23 |
| 02091500 | Contentnea Creek at Hookerton, NC. | 729 | 58 | 99.1 (1981) | 58 (1955) | 87 | 18 | 44 | 13 |
| 02118000 | South Yadkin River near Mocksville, NC. | 306 | 48 | 146 (1941) | 100 (1941) | 124 | 37 | 107 | 10 |
| 02131000 | Pee Dee River at Peedee, SC. | 8,830 | 48 | 3,083 (1981) | 1,200 (1981) | 2,516 | 33 | . . . | . . . |
| 02226000 | Altamaha River at Doctortown, GA. | 13,600 | 55 | 4,326 (1981) | 2,820 (1981) | 2,960 | 24 | 2,580 | 29 |
| 02256500 | Fisheating Creek at Palmdale, FL. | 311 | 55 | 0.0 (1985) | 0.0 (1932) | 0.0 | 0 | 0.0 | (*) |
| 02317500 | Alapaha River at Statenville, GA. | 1,400 | 51 | 86.4 (1968) | 38 (1938) | 78 | 12 | 54 | 31 |
| 02358000 | Apalachicola River at Chattahoochee, FL. | 17,300 | 57 | 9,840 (1941) | 6,990 (1941) | 9,190 | 46 | . . . | . . . |
| | HIGH FLOWS | | | | | | | | |
| 05062000 | Buffalo River near Dilworth, MN. | 1,040 | 55 | 906 (1962) | 3,100 (1962) | 923 | 442 | 2,000 | 14 |
| 05280000 | Crow River at Rockford, MN. | 2,520 | 61 | 4,564 (1975) | 11,000 (1906) | 6,020 | 492 | 8,790 | 5 |
| 05288500 | Mississippi River near Anoka, MN. | 19,100 | 55 | 38,490 (1950) | 58,800 (1975) | 39,965 | 266 | 49,700 | 16 |
| 05330000 | Minnesota River near Jordan, MN. | 16,200 | 52 | 20,630 (1944) | 35,100 (1960) | 22,248 | 404 | 35,800 | 5 |
| 05331000 | Mississippi River at St. Paul, MN. | 36,800 | 88 | 48,460 (1975) | 78,100 (1975) | 64,232 | 290 | 83,900 | 5 |
| 06485500 | Big Sioux River at Akron, IA. | 9,030 | 58 | 6,930 (1984) | 11,100 (1984) | 7,830 | 913 | 16,300 | 1 |

*Occurred more than once.

southern Canada had flows in the normal to above-normal range, compared with the 61 percent in these ranges for last month. About 68 percent of the index stations in the United States east of the Mississippi River had flows in the below-normal range compared with about 71 percent in that range for last month.

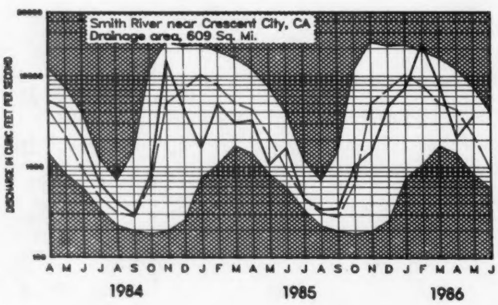
Below-normal streamflow persisted in Rhode Island, Kentucky, the Carolinas, Georgia, Alabama, and also in parts of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, Ohio, Illinois, Tennessee, Louisiana, Mississippi, Florida, and Washington. Flows moved into the below-normal range in parts of Alaska, British Columbia, Washington, Idaho, Montana, California, Arizona, Ontario, Michigan, Wisconsin, Quebec, Nova Scotia, Maine, New Hampshire, Vermont, New York, New Jersey, Pennsylvania, Maryland, Delaware, and Florida, and also in all of New Brunswick.

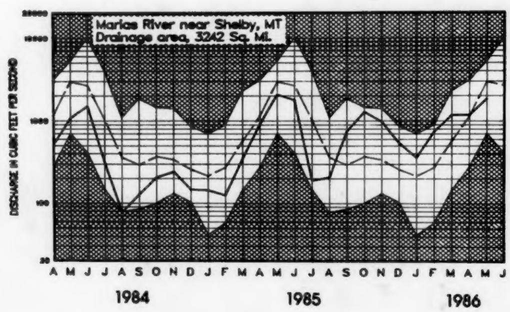
Above-normal streamflow persisted in parts of Hawaii, Quebec, Oklahoma, Ontario, Manitoba, Minnesota, Wisconsin, Illinois, Iowa, Missouri, the Dakotas, Nebraska, Montana, Wyoming, Colorado, New Mexico, Idaho, Utah, Nevada, and California. Flows moved into the above-normal range in Puerto Rico, and also in parts of Hawaii, Washington, Oregon, California, Montana, the Dakotas, Manitoba, Minnesota, Wisconsin, Illinois, Iowa, Missouri, Virginia, and Quebec.

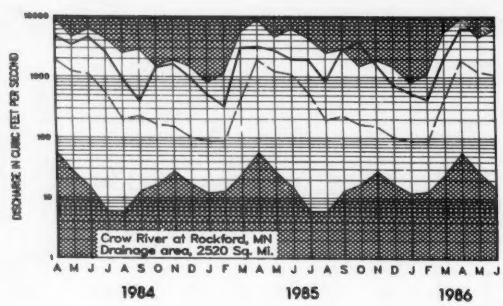
Flood stages, as designated by the National Weather Service, were exceeded on many rivers and small streams in Washington, Idaho, Nevada, California, Montana, Colorado, New Mexico, the Dakotas, Nebraska, Kansas, Oklahoma, Texas, Minnesota, Iowa, Missouri, Arkansas, Louisiana, Mississippi, Wisconsin, Illinois, Indiana, Kentucky, New York, New Jersey, and Florida.

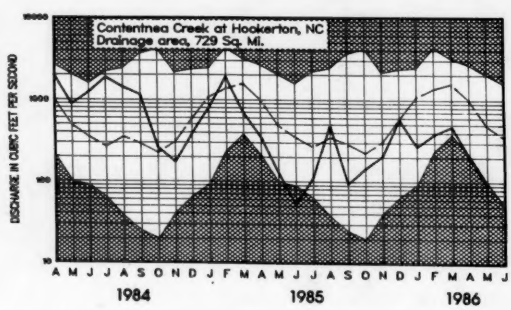
## SURFACE WATER — MONTHLY MEAN DISCHARGE IN KEY STREAMS

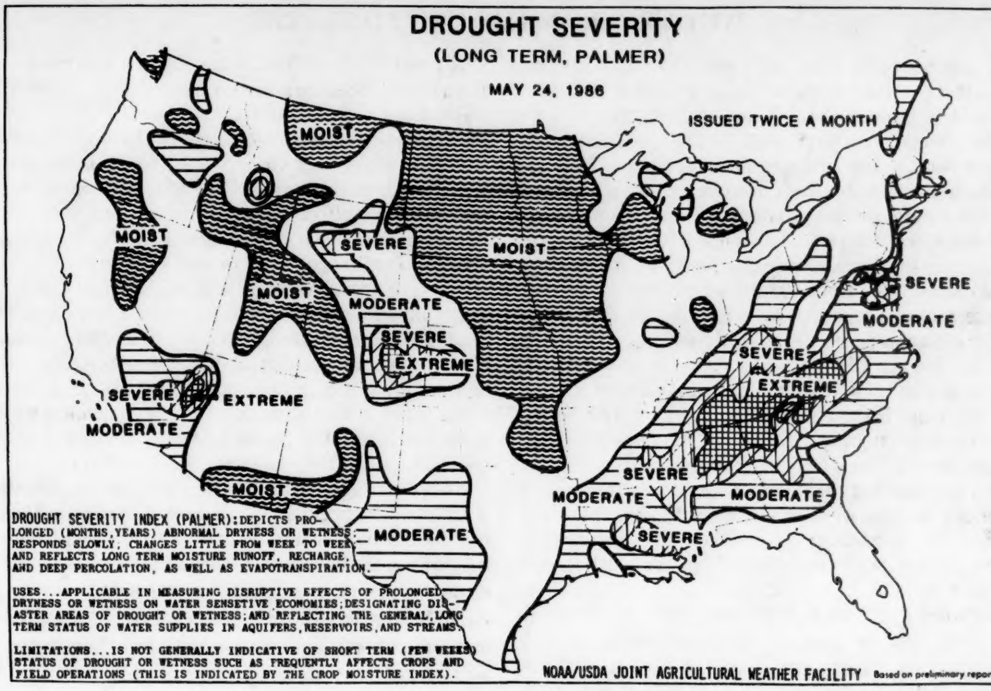
Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period, 1951-80. Heavy line indicates mean for current period.

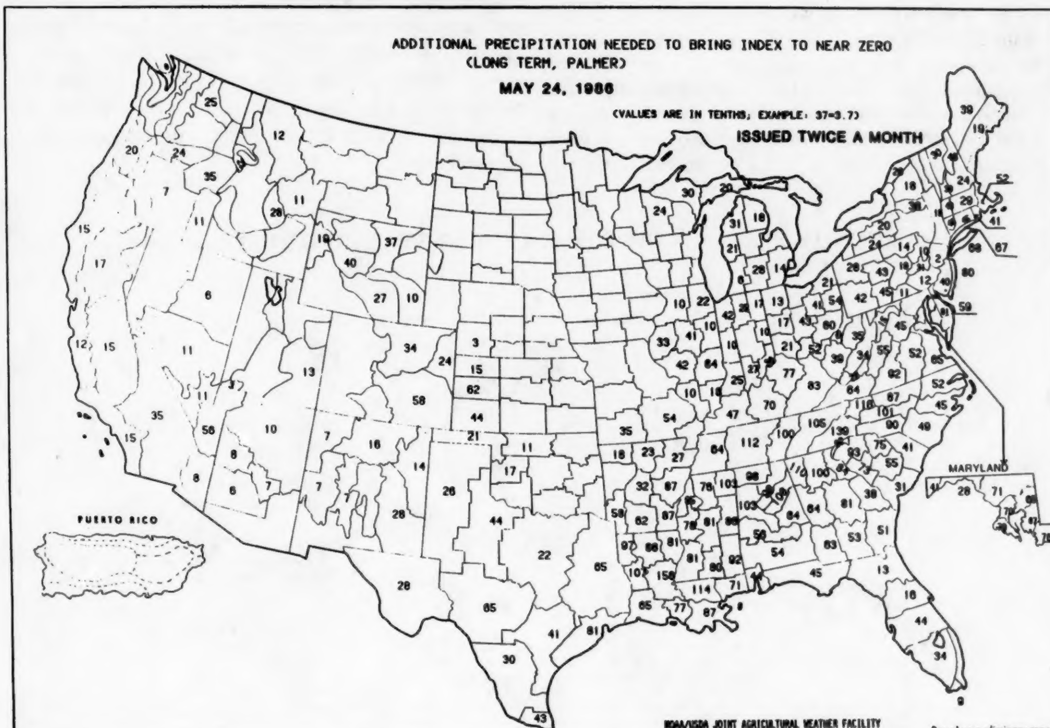





(From *Weekly Weather and Crop Bulletin* prepared and published by the NOAA/USDA Joint Agricultural Weather Facility)

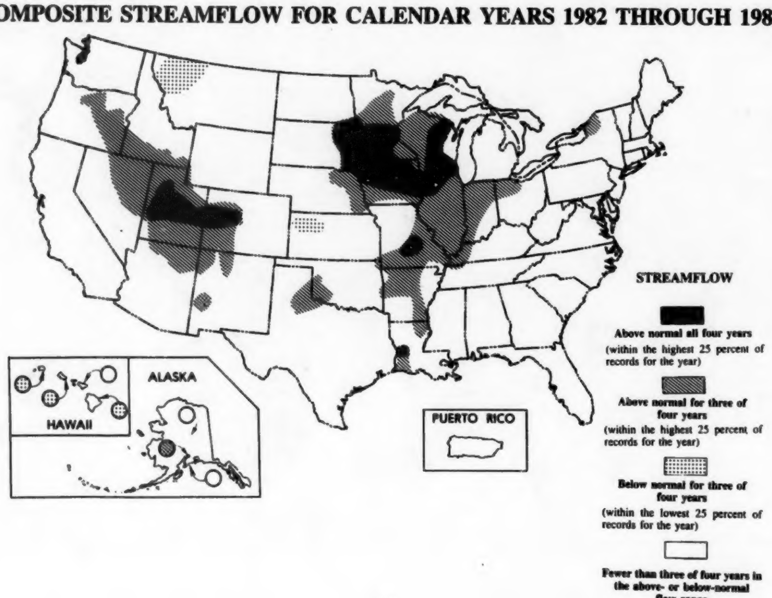
## WET TREND IN THE UNITED STATES

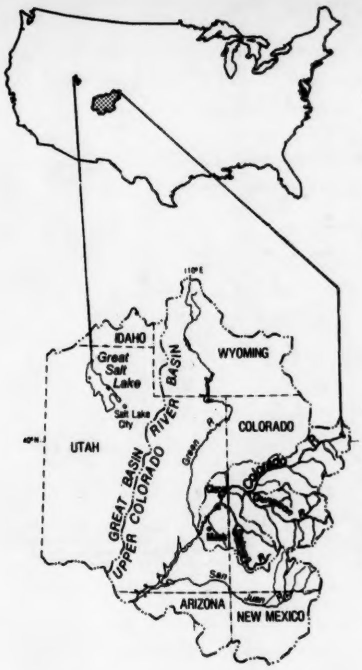
The rise of the Great Salt Lake to an elevation higher than that observed by the Mormon settlers in 1873 (they arrived in Utah in 1847) is just one symptom of a wet trend affecting two large areas (and several small areas) of the Nation. The first area includes parts of Utah and adjacent States and extends into Oregon; the second area includes parts of the Mississippi River basin and the western Great Lakes/St. Lawrence River basin, as can be seen on the map showing composite annual (calendar year) streamflow from 1982 through 1985. (The composite map was produced by overlaying the four annual maps and appropriately shading those areas with above-normal flows in all 4 years and above- or below-normal flows in 3 out of 4 years.) In contrast, parts of Kansas, Montana, and Hawaii have had 3 of 4 years in the below-normal flow range, but no part of the Nation has had below-normal flows for 4 consecutive years.

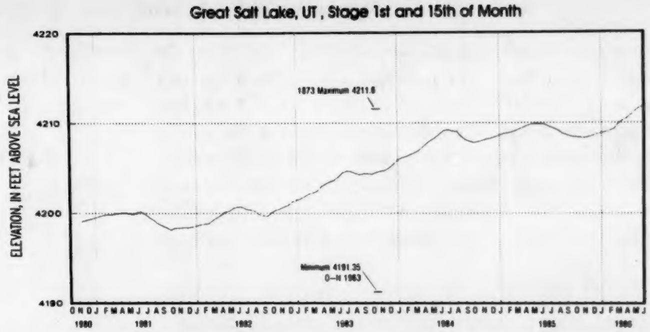
Two excellent measures of wetness in the western area are the elevation of Great Salt Lake, for which records (or computations) go back to 1847, and the flow of the Colorado River near Cisco, Utah, for which records go back to 1895. The 12.15-foot rise of the Great Salt Lake from 4,199.65 feet on September 15, 1982, to 4,211.80 feet on June 1, 1986, exceeded in both magnitude and rapidity the 12-foot rise from 4,199.6 feet in 1861 to 4,211.6 feet in 1873. (The data presented are for the south arm of the lake only.) The seasonal rises of the lake in 1982–83, 1983–84, and 1985–86 (through June 1) rank 1, 2, 3 in elevation, and 2, 1, 3 in volume, respectivley, for the period 1847–1986. Total increase in volume from the 1982 seasonal low to June 1, 1986, was 9,486,140 acre-feet (3,092 billion gallons)—enough water to cover Rhode Island (area 1,214 square miles) with 12.21 feet of water. The hydrograph of lake elevations from the 1980 seasonal low to June 1, 1986, shows lake fluctuations in detail and illustrates the cumulative effect of excess precipitation in the area. The hydrograph of the Colorado River near Cisco, Utah (which is the major runoff-producing area of the Colorado River basin), shows the immediate effect of excess precipitation at the core of the wet area. Flow at this index station has been in the above-normal range for 45 of the last 46 months, 37 of them consecutive. What the hydrograph does not show is that June is the only month for which a monthly mean discharge observed during 1983–86 is not within the three highest of record and that 23 of the 36 slots for the three highest flows of each individual month are occupied by flows which occurred during 1983-86 (including all of those for November through March)—evidence of an unparalled period of above-normal flow in the area.

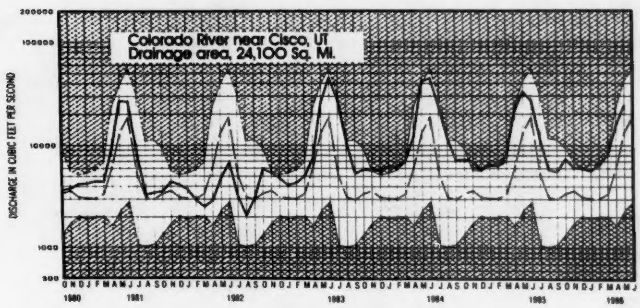
On the fringes of the second large area on the other side of the Continental Divide, Lake Superior and Lake Erie have been at record high levels for several months, flow of the St. Lawrence River during February was a record high for the month with flows during March, April, and May 1986 the second highest ever recorded for those months, and both Lake Huron and Lake Ontario are at well above normal levels, as can be seen on the hydrographs. Flow of the St. Lawrence River has been in the above-normal range for 25 of the last 31 months, 16 of them consecutive. Crow River at Rockford, Minnesota, (hydrograph on page 4), in the core of this area of above-normal flows, has been in the above-normal range for 36 of the last 44 months, the last 20 of them consecutive.

### COMPOSITE STREAMFLOW FOR CALENDAR YEARS 1982 THROUGH 1985

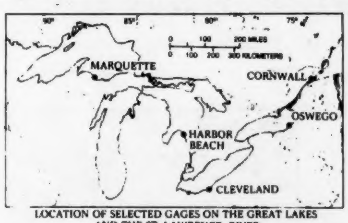




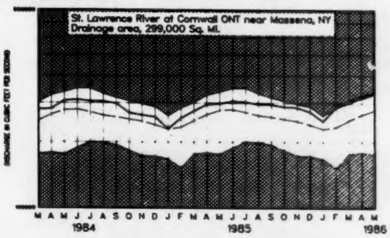



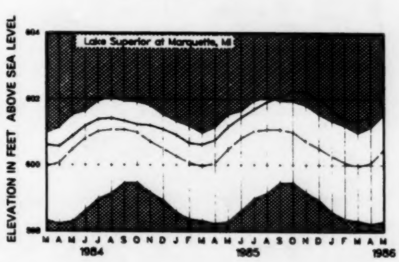



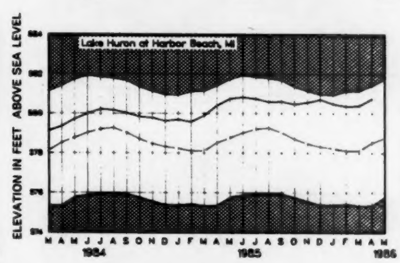

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period, 1951–80. Heavy line indicates mean for current period. (Great Lakes elevations from National Weather Service.)

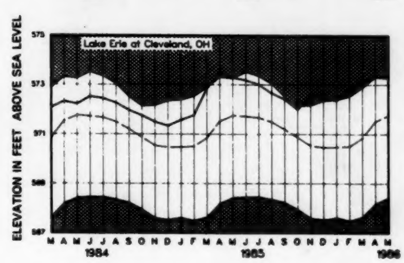


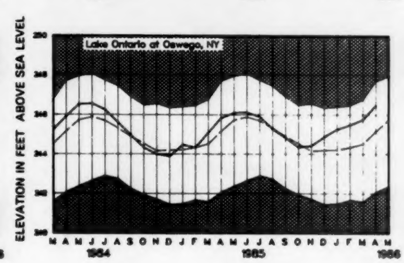

LOCATION OF SELECTED GAGES ON THE GREAT LAKES AND THE ST. LAWRENCE RIVER



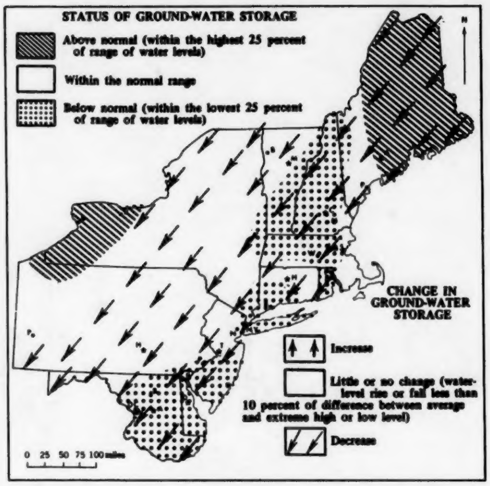



## GROUND-WATER CONDITIONS DURING MAY 1986

Ground-water levels declined seasonally in most of the region. (See map.) The principal exceptions were rises in water levels in parts of western New York and Pennsylvania. Ground-water levels near the end of the month were above average in parts of Maine and western New York State. Below-average levels persisted in much of central New England, and levels were also below-average in much of Maryland, Delaware, and southern New Jersey.

In the Southeastern States, ground-water levels showed mixed trends in West Virginia, Kentucky, Arkansas, and Louisiana. Water levels declined in Virginia and North Carolina, and in most wells in Mississippi and Georgia. Water levels were mixed with respect to average in West Virginia, Louisiana, and Florida, and were below average in Kentucky, Virginia, North Carolina, Arkansas, and Mississippi. New low ground-water levels for May were reached in Tennessee, Mississippi, and Georgia, and the water level in the key well in the Savannah area in the coastal plain of Georgia declined to a new all-time low in 30 years of record.

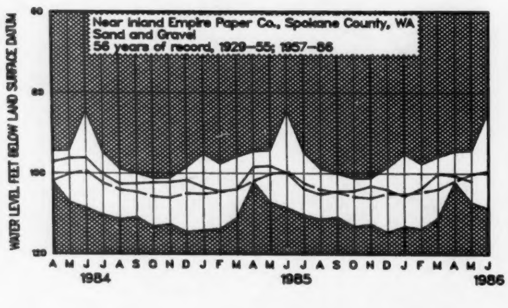
In the central and western Great Lakes States, ground-water levels rose in Iowa, showed mixed trends in Minnesota, and declined in Michigan and Ohio. Water levels were above average in Minnesota and Michigan, mostly above average in Iowa, and generally below average in Indiana and Ohio.

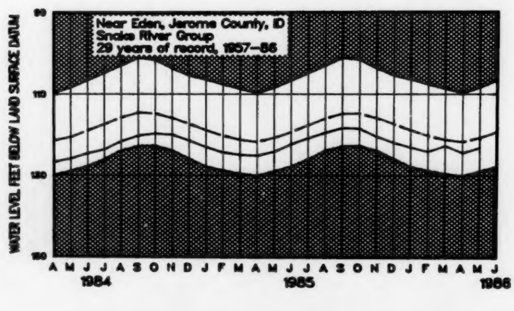


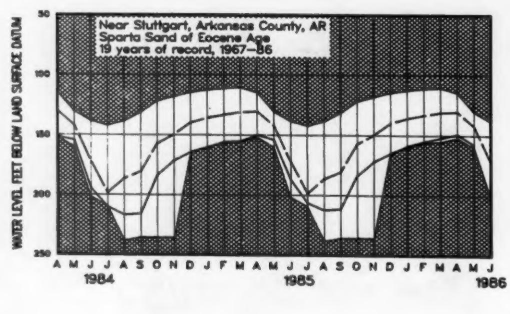

Map showing ground-water storage near end of May and change in ground-water storage from end of April to end of May.

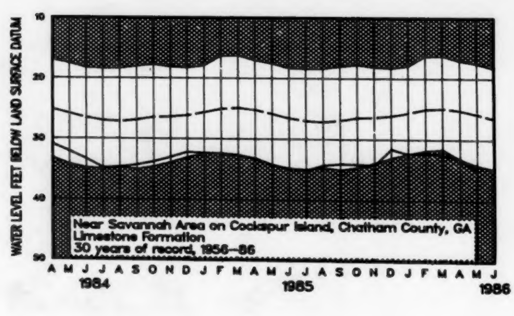
## MONTH-END GROUND-WATER LEVELS IN KEY WELLS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates average of monthly levels in previous years. Heavy line indicates level for current period.



In the Western States, ground-water levels rose in Arizona and in most of the key wells in Idaho, and declined in Nevada. Trends were mixed in other Western States. Water levels were above average in North Dakota and Nebraska, and were mixed with respect to average in other States. New high water levels for May were recorded in the Steptoe Valley well in Nevada, and in the Berrendo-Smith well in New Mexico, despite slight net declines during the month. The level in the key well in the Blanding area in Utah rose, also reaching a new high level for May. Levels declined to new May low levels in the key well at the Kansas Agricultural Experiment Station in Colby, and in the El Paso well in Texas.

**Provisional data; subject to revision**

## WATER LEVELS IN KEY OBSERVATION WELLS IN SOME REPRESENTATIVE AQUIFERS IN THE CONTERMINOUS UNITED STATES—MAY 1986

| Aquifer and Location | Water level in feet with reference to land-surface datum | Departure from average in feet | Net change in water level in feet since: | | Year records began | Remarks |
|---|---|---|---|---|---|---|
| | | | Last month | Last year | | |
| Glacial drift at Hanska, south-central Minnesota. | −3.86 | +1.67 | −1.19 | −0.88 | 1942 | |
| Glacial drift at Roscommon in north-central part of Lower Peninsula, Michigan. | −3.54 | +0.39 | −0.23 | −0.46 | 1935 | |
| Glacial drift at Marion, Iowa........................ | −2.28 | +1.41 | +0.52 | +1.47 | 1941 | |
| Glacial drift at Princeton in northwestern Illinois. | −6.44 | +1.49 | +1.54 | +2.08 | 1943 | |
| Petersburg Granite, southeastern Piedmont near Fall Zone, Colonial Heights, Virginia. | −15.09 | −0.25 | −0.45 | +1.23 | 1939 | |
| Glacial outwash sand and gravel, Louisville, Kentucky (U.S. well no. 2). | −17.50 | +7.42 | −0.02 | −1.03 | 1946 | |
| 500-foot sand aquifer near Memphis, Tennessee (U.S. well no. 2). | −104.73 | −15.91 | −0.06 | −1.07 | 1941 | May low. |
| Granite in eastern Piedmont Province, Chapel Hill, North Carolina (U.S. well no. 5). | −42.29 | −1.11 | −0.32 | −1.84 | 1931 | |
| Sparta Sand in Pine Bluff industrial area, Arkansas. | −219.15 | −12.51 | −1.05 | +3.35 | 1958 | |
| Eutaw Formation in the City of Montgomery, Alabama (U.S. well no. 4). | −25.0 | −4.6 | −0.2 | −3.2 | 1952 | |
| Limestone aquifer on Cockspur Island, Savannah area, Georgia (U.S. well no. 6). | −35.18 | −8.84 | −2.09 | +0.94 | 1956 | Alltime low. |
| Sand and gravel in Puget Trough, Tacoma, Washington. | −99.78 | +9.60 | +0.32 | +8.50 | 1952 | |
| Pleistocene glacial outwash gravel, North Pole, northern Idaho (U.S. well no. 3). | −461.5 | −1.0 | +0.2 | −2.5 | 1929 | |
| Snake River Group: Snake River Plain Aquifer, at Eden, Idaho (U.S. well no. 4). | −123.1 | −2.3 | +1.2 | +0.9 | 1957 | |
| Alluvial valley fill in Flowell area, Millard County, Utah (U.S. well no. 9). | −9.08 | +28.45 | −0.29 | −1.81 | 1929 | |
| Alluvial sand and gravel, Platte River Valley, Ashland, Nebraska (U.S. well no. 6). | −3.20 | +0.96 | +0.34 | −0.57 | 1935 | |
| Alluvial Valley fill in Steptoe Valley, Nevada. | −7.07 | +5.49 | −0.33 | +0.59 | 1950 | May high. |
| Pleistocene terrace deposits in Kansas River valley, at Lawrence, northeastern Kansas. | −17.08 | +3.59 | +1.14 | +1.11 | 1953 | |
| Alluvium and Paso Robles clay, sand, and gravel, Santa Maria Valley, California | −127.71 | +13.30 | −15.75 | −28.02 | 1957 | |
| Valley fill, Elfrida area, Douglas, Arizona (U.S. well no. 15). | −104.4 | −23.9 | +0.4 | +0.9 | 1951 | |
| Hueco bolson, El Paso area, Texas................ | −266.18 | −18.39 | −1.38 | −1.67 | 1965 | May low. |
| Evangeline aquifer, Houston area, Texas......... | −305.60 | −9.85 | +1.90 | −4.18 | 1965 | |

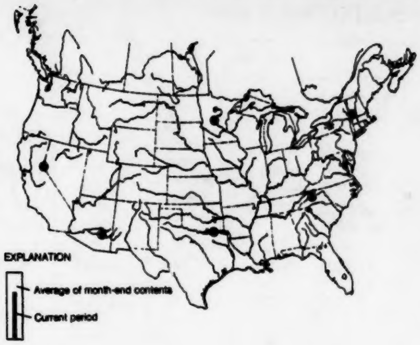
# USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF MAY 1986

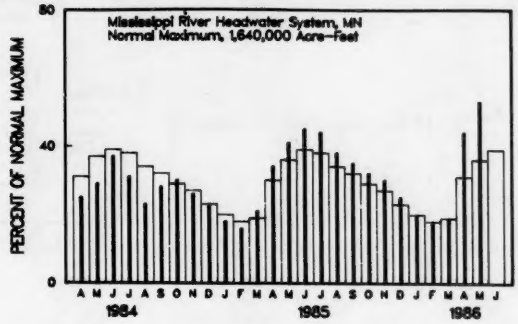
[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

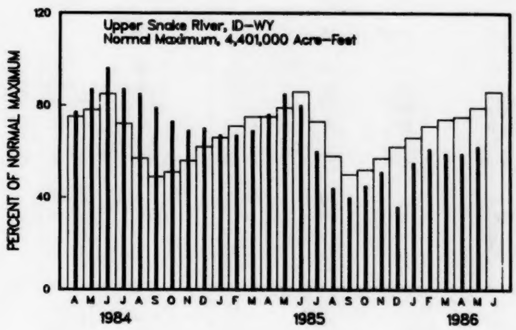
| Reservoir<br>Principal uses:<br>F-Flood control<br>I-Irrigation<br>M-Municipal<br>P-Power<br>R-Recreation<br>W-Industrial | Percent of normal maximum | | | | Normal maximum[a] (acre-feet) |
|---|---|---|---|---|---|
| | End of May 1986 | End of May 1985 | Average for end of May | End of Apr. 1986 | |
| **NOVA SCOTIA** | | | | | |
| Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs(P) | 57 | 47 | 78 | 56 | [b]226,300 |
| **QUEBEC** | | | | | |
| Allard (P) | 83 | 85 | 88 | 76 | 280,600 |
| Gouin (P) | 75 | 82 | 65 | 57 | 6,954,000 |
| **MAINE** | | | | | |
| Seven reservoir systems (MP) | 89 | 75 | 90 | 85 | 4,107,000 |
| **NEW HAMPSHIRE** | | | | | |
| First Connecticut Lake (P) | 90 | 97 | 87 | 67 | 76,450 |
| Lake Francis (FPR) | 72 | 80 | 83 | 62 | 99,310 |
| Lake Winnipesaukee (PR) | 102 | 82 | 102 | 94 | 165,700 |
| **VERMONT** | | | | | |
| Harriman (P) | 91 | 94 | 87 | 86 | 116,200 |
| Somerset (P) | 86 | 77 | 86 | 80 | 57,390 |
| **MASSACHUSETTS** | | | | | |
| Cobble Mountain and Borden Brook (MP) | 82 | 65 | 90 | 84 | 77,920 |
| **NEW YORK** | | | | | |
| Great Sacandaga Lake (FPR) | 100 | 92 | 97 | 90 | 786,700 |
| Indian Lake (FMP) | 103 | 92 | 103 | 96 | 103,300 |
| New York City reservoir system (MW) | 100 | 61 | 100 | 99 | 1,680,000 |
| **NEW JERSEY** | | | | | |
| Wanaque (M) | 97 | 68 | 95 | 101 | 85,100 |
| **PENNSYLVANIA** | | | | | |
| Allegheny (FPR) | 51 | 46 | 47 | 52 | 1,180,000 |
| Pymatuning (FMR) | 101 | 95 | 99 | 96 | 188,000 |
| Raystown Lake (FR) | 68 | 68 | 61 | 68 | 761,900 |
| Lake Wallenpaupack (PR) | 80 | 90 | 79 | 81 | 157,800 |
| **MARYLAND** | | | | | |
| Baltimore municipal system (M) | 84 | 94 | 95 | 86 | 261,900 |
| **NORTH CAROLINA** | | | | | |
| Bridgewater (Lake James) (P) | 92 | 92 | 92 | 90 | 288,800 |
| Narrows (Badin Lake) (P) | 89 | 94 | 99 | 90 | 128,900 |
| High Rock Lake (P) | 73 | 78 | 83 | 67 | 234,800 |
| **SOUTH CAROLINA** | | | | | |
| Lake Murray (P) | 89 | 87 | 84 | 89 | 1,614,000 |
| Lakes Marion and Moultrie (P) | 80 | 82 | 80 | 80 | 1,862,000 |
| **SOUTH CAROLINA—GEORGIA** | | | | | |
| Clark Hill (FP) | 56 | 67 | 76 | 57 | 1,730,000 |
| **GEORGIA** | | | | | |
| Burton (PR) | 100 | 96 | 94 | 92 | 104,000 |
| Sinclair (MPR) | 87 | 88 | 93 | 89 | 214,000 |
| Lake Sidney Lanier (FMPR) | 49 | 64 | 66 | 50 | 1,686,000 |
| **ALABAMA** | | | | | |
| Lake Martin (P) | 91 | 99 | 95 | 92 | 1,375,000 |
| **TENNESSEE VALLEY** | | | | | |
| Clinch Projects: Norris and Melton Hill Lakes (FPR) | 52 | 55 | 66 | 51 | 2,293,000 |
| Douglas Lake (FPR) | 41 | 45 | 72 | 36 | 1,394,000 |
| Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR) | 62 | 67 | 83 | 60 | 1,012,000 |
| Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR) | 64 | 60 | 71 | 58 | 2,880,000 |
| Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR) | 55 | 60 | 84 | 52 | 1,478,000 |
| **WISCONSIN** | | | | | |
| Chippewa and Flambeau (PR) | 91 | 96 | 86 | 94 | 365,000 |
| Wisconsin River (21 reservoirs) (PR) | 79 | 91 | 82 | 87 | 399,000 |
| **MINNESOTA** | | | | | |
| Mississippi River headwater system (FMR) | 53 | 41 | 37 | 44 | 1,640,000 |
| **NORTH DAKOTA** | | | | | |
| Lake Sakakawea (Garrison) (FIPR) | 84 | 84 | 86 | 79 | 22,700,000 |
| **SOUTH DAKOTA** | | | | | |
| Angostura (I) | 94 | 74 | 90 | 92 | 127,600 |
| Belle Fourche (I) | 86 | 77 | 74 | 62 | 185,200 |
| Lake Francis Case (FIP) | 87 | 76 | 82 | 86 | 4,834,000 |
| Lake Oahe (FIP) | 100 | 88 | ... | 97 | 22,530,000 |
| Lake Sharpe (FIP) | 101 | 100 | 100 | 101 | 1,725,000 |
| Lewis and Clark Lake (FIP) | 76 | 77 | 85 | 77 | 477,000 |
| **NEBRASKA** | | | | | |
| Lake McConaughy (IP) | 88 | 85 | 80 | 84 | 1,948,000 |
| **OKLAHOMA** | | | | | |
| Eufaula (FRP) | 113 | 98 | 97 | 99 | 2,378,000 |
| Keystone (FPR) | 107 | 100 | 107 | 85 | 661,000 |
| Tenkiller Ferry (FPR) | 109 | 105 | 103 | 109 | 628,200 |
| Lake Altus (FIMR) | 31 | 25 | 66 | 30 | 133,000 |
| Lake O'The Cherokees (FPR) | 94 | 97 | 94 | 96 | 1,492,000 |
| **OKLAHOMA—TEXAS** | | | | | |
| Lake Texoma (FMPRW) | 100 | 98 | 103 | 96 | 2,722,000 |
| **TEXAS** | | | | | |
| Bridgeport (IMW) | 90 | 82 | 54 | 79 | 386,400 |
| Canyon (FMR) | 99 | 87 | 81 | 96 | 385,600 |
| International Amistad (FIMPW) | 42 | 63 | 81 | 54 | 3,497,000 |
| International Falcon (FIMPW) | 28 | 36 | 65 | 24 | 2,668,000 |
| Livingston (IMW) | 105 | 102 | 91 | 101 | 1,788,000 |
| Possum Kingdom (IMPRW) | 92 | 97 | 98 | 86 | 570,200 |
| Red Bluff (PI) | 19 | 27 | 26 | 21 | 307,000 |
| Toledo Bend (P) | 97 | 101 | 93 | 93 | 4,472,000 |
| Twin Buttes (FIM) | 11 | 12 | 31 | 11 | 177,800 |
| Lake Kemp (IMW) | 93 | 89 | 89 | 89 | 268,000 |
| Lake Meredith (FWM) | 28 | 35 | 36 | 29 | 796,900 |
| Lake Travis (FIMPRW) | 94 | 93 | 83 | 93 | 1,144,000 |
| **MONTANA** | | | | | |
| Canyon Ferry (FIMPR) | 81 | 82 | 80 | 75 | 2,043,000 |
| Fort Peck (FPR) | 80 | 81 | 86 | 76 | 18,910,000 |
| Hungry Horse (FIPR) | 65 | 87 | 74 | 79 | 3,451,000 |
| **WASHINGTON** | | | | | |
| Ross (PR) | 71 | 59 | 57 | 51 | 1,052,000 |
| Franklin D. Roosevelt Lake (IP) | 63 | 33 | 73 | 55 | 5,022,000 |
| Lake Chelan (PR) | 90 | 63 | 73 | 57 | 676,100 |
| Lake Cushman (PR) | 102 | 72 | 95 | 98 | 359,500 |
| Lake Merwin (P) | 104 | 107 | 104 | 103 | 245,600 |
| **IDAHO** | | | | | |
| Boise River (4 reservoirs) (FIP) | 81 | 93 | 82 | 77 | 1,235,000 |
| Coeur d'Alene Lake (P) | 96 | 121 | 125 | 70 | 238,500 |
| Pend Oreille Lake (FP) | 48 | 85 | 82 | 51 | 1,561,000 |
| **IDAHO—WYOMING** | | | | | |
| Upper Snake River (8 reservoirs) (MP) | 62 | 85 | 79 | 59 | 4,401,000 |
| **WYOMING** | | | | | |
| Boysen (FIP) | 64 | 70 | 67 | 62 | 802,000 |
| Buffalo Bill (IP) | 70 | 68 | 74 | 70 | 421,300 |
| Keyhole (F) | 39 | 40 | 50 | 35 | 193,800 |
| Pathfinder, Seminoe, Alcova, Kortes, Glendo, and Guernsey Reservoirs (I) | 78 | 83 | 61 | 72 | 3,056,000 |
| **COLORADO** | | | | | |
| John Martin (FIR) | 59 | 97 | 17 | 71 | 364,400 |
| Taylor Park (IR) | 59 | 84 | 70 | 46 | 106,200 |
| Colorado-Big Thompson project (I) | 75 | 87 | 64 | 93 | 730,300 |
| **COLORADO RIVER STORAGE PROJECT** | | | | | |
| Lake Powell; Flaming Gorge, Fontenelle, Navajo, and Blue Mesa Reservoirs (IFPR) | 87 | 94 | 71 | 85 | 31,620,000 |
| **UTAH—IDAHO** | | | | | |
| Bear Lake (IPR) | 95 | 89 | 70 | 86 | 1,421,000 |
| **CALIFORNIA** | | | | | |
| Folsom (FIP) | 88 | 88 | 88 | 69 | 1,000,000 |
| Hetch Hetchy (MP) | 68 | 82 | 70 | 71 | 360,400 |
| Isabella (FIR) | 89 | 66 | 48 | 79 | 568,100 |
| Pine Flat (FI) | 82 | 84 | 73 | 73 | 1,001,000 |
| Clair Engle Lake (Lewiston) (P) | 96 | 87 | 91 | 92 | 2,438,000 |
| Lake Almanor (P) | 106 | 74 | 66 | 100 | 1,036,000 |
| Lake Berryessa (FIMW) | 98 | 87 | 88 | 100 | 1,600,000 |
| Millerton Lake (FI) | 61 | 84 | 78 | 42 | 503,200 |
| Shasta Lake (FIPR) | 93 | 54 | 91 | 93 | 4,377,000 |
| **CALIFORNIA—NEVADA** | | | | | |
| Lake Tahoe (IPR) | 93 | 82 | 68 | 88 | 744,600 |
| **NEVADA** | | | | | |
| Rye Patch (I) | 95 | 91 | 72 | 94 | 194,300 |
| **ARIZONA—NEVADA** | | | | | |
| Lake Mead and Lake Mohave (FIMP) | 92 | 93 | 71 | 90 | 27,970,000 |
| **ARIZONA** | | | | | |
| San Carlos (IP) | 90 | 99 | 27 | 95 | 935,100 |
| Salt and Verde River system (IMPR) | 94 | 98 | 54 | 98 | 2,019,100 |
| **NEW MEXICO** | | | | | |
| Conchas (FIR) | 78 | 85 | 79 | 81 | 330,100 |
| Elephant Butte and Caballo (FIPR) | 93 | 89 | 34 | 95 | 2,453,000 |

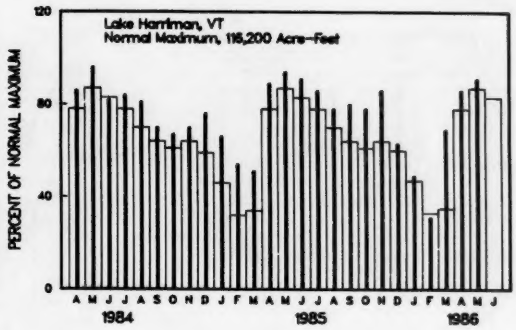
[a]1 acre-foot = 0.04356 million cubic feet = 0.326 million gallons = 0.504 cubic feet per second day.
[b]Thousands of kilowatt-hours (the potential electric power that could be generated by the volume of water in storage).

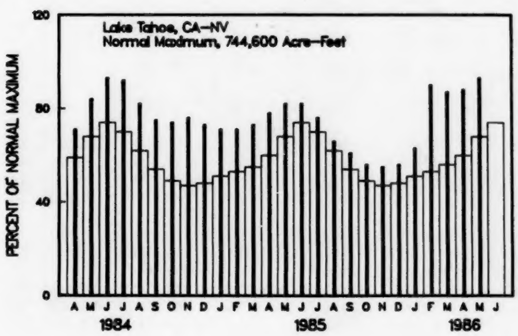
# USABLE CONTENTS OF SELECTED RESERVOIRS AND RESERVOIR SYSTEMS

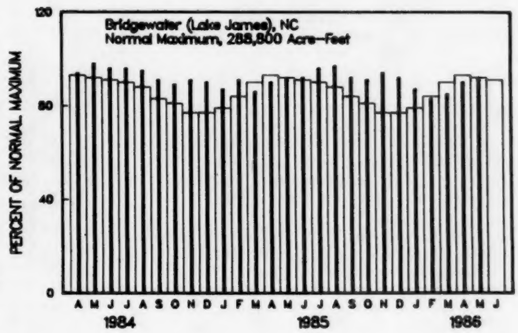


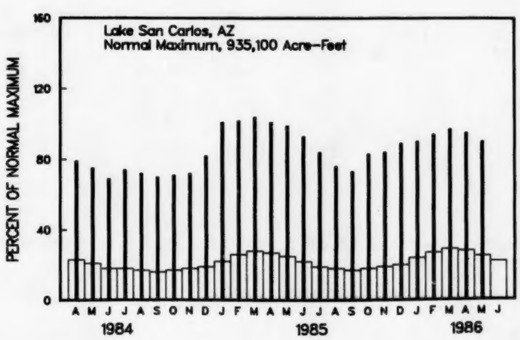



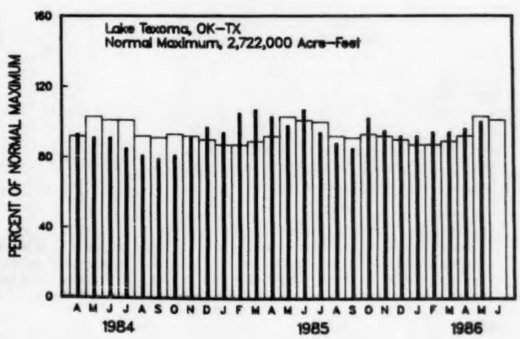



# FLOW OF LARGE RIVERS DURING MAY 1986

| Station number | Stream and place of determination | Drainage area (square miles) | Average discharge through September 1980 (cubic feet per second) | May 1986: Monthly mean discharge (cubic feet per second) | Percent of median monthly discharge, 1951—80 | Change in discharge from previous month (percent) | Discharge near end of month: Cubic feet per second | Million gallons per day | Date |
|---|---|---|---|---|---|---|---|---|---|
| 01014000 | St. John River below Fish River at Fort Kent, ME. | 5,690 | 9,647 | 17,000 | 50 | −49 | 14,900 | 9,630 | 31 |
| 01318500 | Hudson River at Hadley, NY | 1,664 | 2,909 | 3,750 | 75 | −54 | 3,950 | 2,552 | 31 |
| 01357500 | Mohawk River at Cohoes, NY | 3,456 | 5,734 | 5,220 | 78 | −46 | 2,500 | 1,620 | 31 |
| 01463500 | Delaware River at Trenton, NJ | 6,780 | 11,750 | 12,650 | 100 | −29 | 9,860 | 6,372 | 31 |
| 01570500 | Susquehanna River at Harrisburg, PA. | 24,100 | 34,530 | 24,160 | 57 | −53 | 24,700 | 15,960 | 29 |
| 01646500 | Potomac River near Washington, DC. | 11,560 | [1]11,490 | [1] 7,580 | 54 | −42 | 5,560 | 3,593 | 31 |
| 02105500 | Cape Fear River at William O. Huske Lock near Tarheel, NC. | 4,810 | 5,005 | 1,180 | 35 | −19 | 1,200 | 780 | 31 |
| 02131000 | Pee Dee River at Peedee, SC | 8,830 | 9,851 | 2,516 | 33 | −29 | 3,530 | 2,281 | 29 |
| 02226000 | Altamaha River at Doctortown, GA | 13,600 | 13,880 | 2,960 | 24 | −60 | 2,580 | 1,667 | 29 |
| 02320500 | Suwannee River at Branford, FL | 7,880 | 6,987 | 5,090 | 77 | −47 | 4,140 | 2,675 | 31 |
| 02358000 | Apalachicola River at Chattahoochee, FL. | 17,200 | 22,570 | 9,190 | 46 | −23 | 8,560 | 5,532 | 31 |
| 02467000 | Tombigbee River at Demopolis lock and dam near Coatopa, AL. | 15,400 | 23,300 | 6,881 | 31 | +50 | 32,000 | 20,700 | 30 |
| 02489500 | Pearl River near Bogalusa, LA | 6,630 | 9,768 | 5,163 | 50 | +32 | 32,000 | 20,700 | 31 |
| 03049500 | Allegheny River at Natrona, PA | 11,410 | [1]19,480 | [1]10,180 | 48 | −54 | 9,000 | 5,800 | 27 |
| 03085000 | Monongahela River at Braddock, PA | 7,337 | [1]12,510 | [1] 8,244 | 59 | −27 | 7,400 | 4,780 | 21 |
| 03193000 | Kanawha River at Kanawha Falls, WV. | 8,367 | 12,590 | 9,646 | 75 | +90 | 8,710 | 5,629 | 27 |
| 03234500 | Scioto River at Higby, OH | 5,131 | 4,547 | 1,597 | 34 | −29 | 1,920 | 1,240 | 30 |
| 03294500 | Ohio River at Louisville, KY[2] | 91,170 | 116,000 | 64,120 | 49 | −14 | 58,730 | 37,960 | 26 |
| 03377500 | Wabash River at Mount Carmel, IL | 28,635 | 27,220 | 30,690 | 96 | +36 | 39,100 | 25,270 | 30 |
| 03469000 | French Broad River below Douglas Dam, TN. | 4,543 | 6,798 | 3,085 | 46 | +2 | ..... | ..... | ... |
| 04084500 | Fox River at Rapide Croche Dam, near Wrightstown, WI.[2] | 6,150 | 4,163 | 4,463 | 78 | −59 | 2,843 | 1,837 | 31 |
| 04264331 | St. Lawrence River at Cornwall, Ontario–near Massena, NY.[3] | 299,000 | 242,700 | 331,300 | 119 | +4 | 319,000 | 206,200 | 31 |
| 02NG001 | St. Maurice River at Grand Mere, PQ. | 16,300 | 25,150 | 70,700 | 103 | +18 | 39,100 | 25,270 | 30 |
| 05082500 | Red River of the North at Grand Forks, ND. | 30,100 | 2,551 | 14,740 | 390 | −23 | 14,200 | 9,180 | 21 |
| 05133500 | Rainy River at Manitou Rapids, MN | 19,400 | 11,830 | 33,800 | 187 | +69 | 31,500 | 20,360 | 27 |
| 05330000 | Minnesota River near Jordan, MN | 16,200 | 3,402 | 22,250 | 404 | −19 | 14,300 | 9,240 | 31 |
| 05331000 | Mississippi River at St. Paul, MN | 36,800 | [1]10,610 | 64,230 | 290 | −6 | 39,000 | 25,200 | 31 |
| 05365500 | Chippewa River at Chippewa Falls, WI. | 5,600 | 5,100 | 6,133 | 101 | −65 | 2,000 | 1,300 | 31 |
| 05407000 | Wisconsin River at Muscoda, WI | 10,300 | 8,617 | 8,145 | 73 | −62 | 6,484 | 4,190 | 30 |
| 05446500 | Rock River near Joslin, IL | 9,551 | 5,873 | 10,700 | 157 | −16 | 10,000 | 6,000 | 31 |
| 05474500 | Mississippi River at Keokuk, IA | 119,000 | 62,620 | 178,500 | 184 | −7 | 209,000 | 135,100 | 31 |
| 06214500 | Yellowstone River at Billings, MT | 11,796 | 7,038 | 11,300 | 85 | +131 | 29,900 | 19,320 | 30 |
| 06934500 | Missouri River at Hermann, MO | 524,200 | 79,490 | 144,000 | 156 | +33 | 147,000 | 95,000 | 30 |
| 07289000 | Mississippi River at Vicksburg, MS[4] | 1,140,500 | 576,600 | 592,400 | 71 | −9 | 764,000 | 493,800 | 27 |
| 07331000 | Washita River near Dickson, OK | 7,202 | 1,368 | 3,760 | 225 | +164 | 3,000 | 1,900 | 21 |
| 08276500 | Rio Grande below Taos Junction Bridge, near Taos, NM. | 9,730 | 725 | 2,103 | 237 | +44 | 2,300 | 1,490 | 30 |
| 09315000 | Green River at Green River, UT | 40,600 | 6,298 | 21,020 | 182 | +58 | ..... | ..... | .. |
| 11425500 | Sacramento River at Verona, CA | 21,257 | 18,820 | 11,002 | 62 | −44 | 12,700 | 8,210 | 28 |
| 13269000 | Snake River at Weiser, ID | 69,200 | 18,050 | 41,500 | 159 | −15 | 43,900 | 28,370 | 31 |
| 13317000 | Salmon River at White Bird, ID | 13,550 | 11,250 | 27,600 | 87 | +49 | 101,100 | 65,340 | 31 |
| 13342500 | Clearwater River at Spalding, ID | 9,570 | 15,480 | 31,800 | 63 | +48 | 65,600 | 42,400 | 31 |
| 14105700 | Columbia River at The Dalles, OR[5] | 237,000 | [1]193,100 | [1]313,600 | 73 | +25 | 268,100 | 173,300 | 27 |
| 14191000 | Willamette River at Salem, OR | 7,280 | [1]23,510 | [1]21,500 | 92 | +24 | 14,500 | 9,370 | 27 |
| 15515500 | Tanana River at Nenana, AK | 25,600 | 23,460 | 27,920 | 95 | +278 | 35,000 | 22,600 | 31 |
| 08MF005 | Fraser River at Hope, BC | 83,800 | 96,290 | 130,300 | 72 | +79 | 269,800 | 174,400 | 30 |

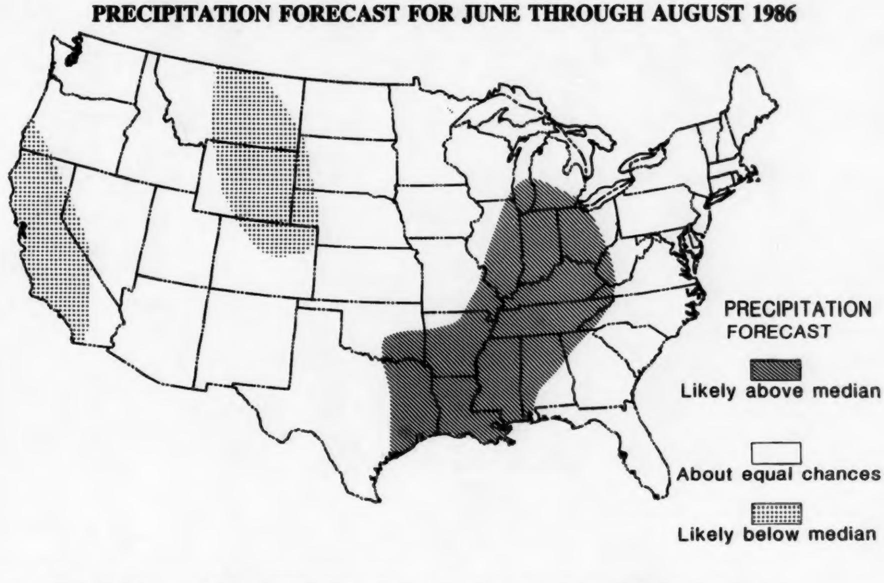
[1]Adjusted.
[2]Records furnished by Corps of Engineers.
[3]Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y. when adjusted for storage in Lake St. Lawrence.
[4]Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.
[5]Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

## DISSOLVED SOLIDS AND WATER TEMPERATURES, FOR MAY 1986, AT DOWNSTREAM SITES ON SIX LARGE RIVERS

| Station number | Station name | May data of following calendar years | Stream discharge during month | Dissolved-solids concentration[a] | | Dissolved-solids discharge[a] | | | Water temperature[b] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mean (cfs) | Minimum (mg/L) | Maximum (mg/L) | Mean (tons per day) | Minimum (tons per day) | Maximum (tons per day) | Mean in °C | Minimum, in °C | Maximum, in °C |
| 01463500 | Delaware River at Trenton, NJ (Morrisville, PA). | 1986 | *11,410 | 84 | 121 | 2,590 | 1,880 | 3,810 | 17.0 | 14.0 | 21.0 |
| | | 1945—85 | 15,370 | 50 | 123 | ..... | 930 | 21,790 | ... | 10.0 | 28.5 |
| | | (Extreme yr) | | (1946) | (1978) | | (1965) | (1984) | | | |
| | | | [c]12,650 | | | | | | | | |
| 04264331 | St. Lawrence River at Cornwall, Ontario, near Massena, NY (median streamflow at Ogdensburg, NY). | 1986 | 331,300 | 166 | 167 | 148,900 | 142,900 | 153,400 | 10.0 | 7.0 | 12.5 |
| | | 1976—85 | 293,300 | 165 | 167 | 131,600 | 109,000 | 153,000 | 9.0 | 4.0 | 13.0 |
| | | (Extreme yr) | | (**) | (**) | | (1981) | (1976) | | | |
| | | | [c]278,300 | | | | | | | | |
| 07289000 | Mississippi River at Vicksburg, MS. | 1986 | 592,400 | 240 | 281 | 411,000 | 347,000 | 561,000 | 23.0 | 19.5 | 25.5 |
| | | 1976—85 | 895,500 | 178 | 290 | 511,500 | 176,000 | 954,000 | 20.0 | 14.5 | 26.0 |
| | | (Extreme yr) | | (1977) | (1982) | | (1977) | (1983) | | | |
| | | | [c]838,200 | | | | | | | | |
| 03612500 | Ohio River at lock and dam 53, near Grand Chain, IL (streamflow station at Metropolis, IL). | 1986 | 132,000 | 173 | 235 | ..... | 47,300 | 95,300 | ... | 16.0 | 22.0 |
| | | 1955—85 | 365,900 | 124 | 287 | ..... | 25,500 | 466,000 | ... | 6.5 | 25.0 |
| | | (Extreme yr) | | (1983) | (1979) | | (1976) | (1984) | | | |
| | | | [c]296,000 | | | | | | | | |
| 06934500 | Missouri River at Hermann, MO (60 miles west of St. Louis, MO). | 1986 | 164,000 | 285 | 468 | 157,000 | 100,000 | 237,000 | 21.0 | 19.0 | 22.5 |
| | | 1976—85 | 123,500 | 211 | 520 | 113,200 | 44,500 | 272,000 | 18.5 | 13.0 | 24.5 |
| | | (Extreme yr) | | (1978) | (1981) | | (1977) | (1983) | | | |
| | | | [c]92,040 | | | | | | | | |
| 14128910 | Columbia River at Warrendale, OR (streamflow station at The Dalles, OR). | 1986 | 249,000 | 90 | 97 | 63,200 | 48,000 | 77,300 | 11.5 | 9.5 | 14.5 |
| | | 1976—85 | 263,400 | 67 | 144 | 68,100 | 37,500 | 102,000 | 12.5 | 9.5 | 16.5 |
| | | (Extreme yr) | | (1976) | (1977) | | (1977) | (1983) | | | |
| | | | [c]427,700 | | | | | | | | |

[a]Dissolved-solids concentrations, when not analyzed directly, are calculated on basis of measurements of specific conductance.
[b]To convert °C to °F: [(1.8 X °C) + 32] = °F.
[c]Median of monthly values for 30-year reference period, water years 1951—80, for comparison with data for current month.
*Dissolved solids and water temperature records are for the first 18 days of the month.
**Occurred several years

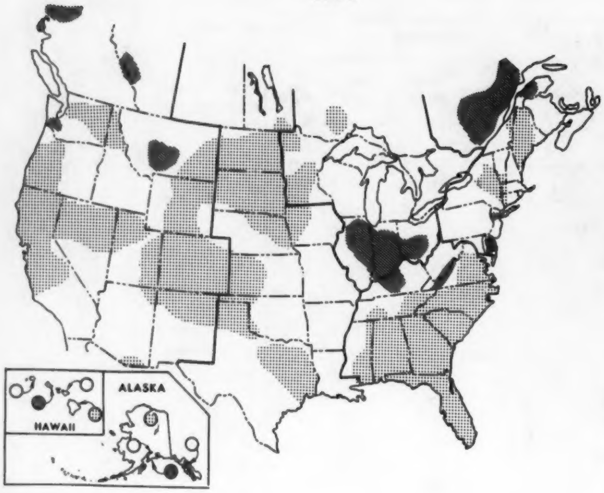
## PRECIPITATION FORECAST FOR JUNE THROUGH AUGUST 1986



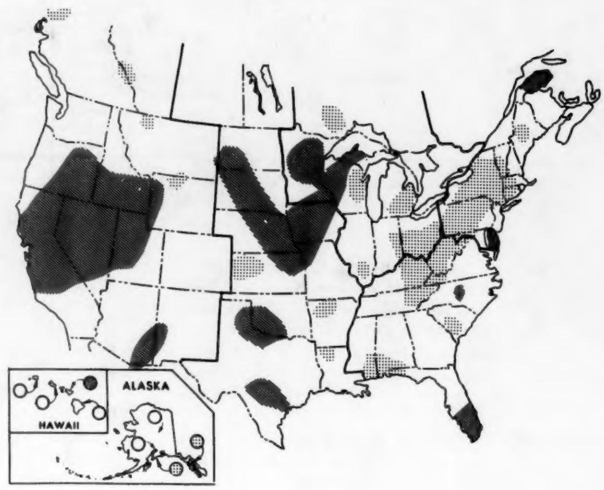

(From Monthly and Seasonal Weather Outlook Published by National Weather Service)

# STREAMFLOW DURING MAY

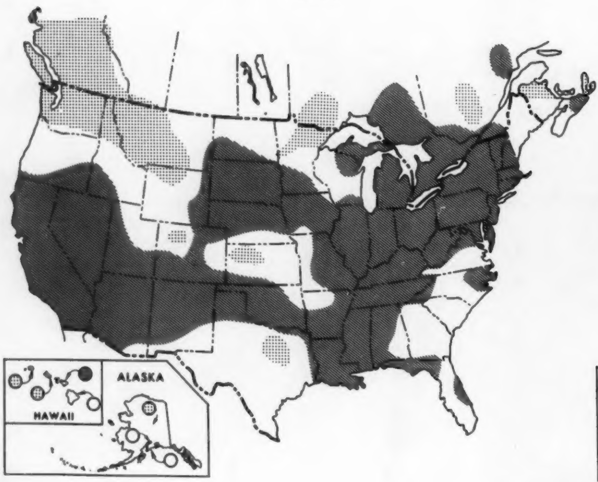
1981



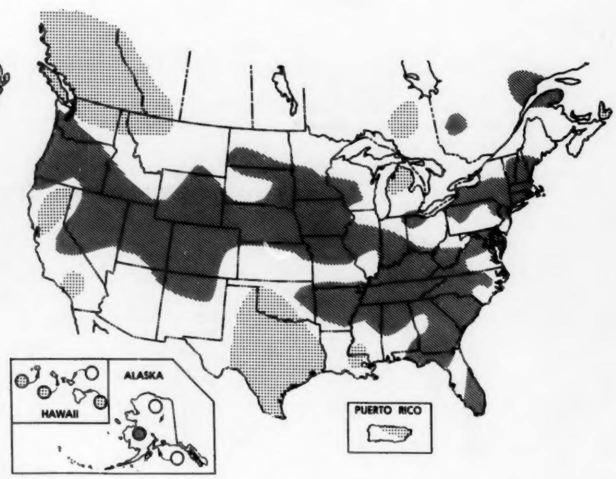

1982




1983




1984



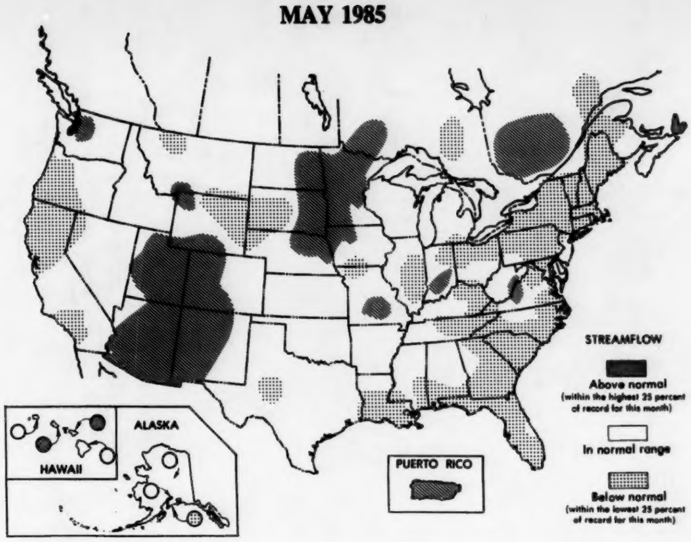

**STREAMFLOW**

Above-normal
(with the highest 25 percent of record for this month)

In normal range

Below normal
(within the lowest 25 percent of record for the month)

## MAY 1985




## NATIONAL WATER CONDITIONS

## MAY 1986

Based on reports from the Canadian and U.S. Field offices; completed July 9, 1986


**TECHNICAL STAFF**

Thomas G. Ross, Editor
Carroll W. Saboe
John C. Kammerer
Allen Sinnott
Krishnaveni V. Sarma
Sharon A. Edmonds
Carole J. Marlow

**COPY PREPARATION**

Lois C. Fleshmon
Sharon L. Peterson
Aisha P.R. Law

**GRAPHICS**

Frances B. Davison
Carolyn L. Moss



The National Water Conditions is published monthly. Subscriptions are free on application to the U.S. Geological Survey, 419 National Center, Reston, VA 22092.


**EXPLANATION OF DATA** (Revised January 1986)

*Cover map* shows generalized pattern of streamflow for the month based on provisional data from 184 index gaging stations—18 in Canada, 164 in the United States, and 2 in the Commonwealth of Puerto Rico. Alaska and Hawaii inset maps show streamflow only at the index gaging stations that are located near the point shown by the arrows. Classifications on map are based on comparison of streamflow for the current month at each index station with the flow for the same month in the 30-year reference period, 1951–80. Shorter reference periods are used for one Canadian index station, two Kansas index stations, one New York index station, and the Puerto Rico index stations because of the limited records available.

The comparative data are obtained by ranking the 30 flows for each month of the reference period in order of decreasing magnitude—the highest flow is given a ranking of 1 and the lowest flow is given a ranking of 30. Quartiles (25-percent points) are computed by averaging the 7th and 8th highest flows (upper quartile), 15th and 16th highest flows (middle quartile and median), and the 23rd and 24th highest flows (lower quartile). The upper and lower quartiles set off the highest 25 percent of flows and lowest 25 percent of flows, respectively, for the reference period. The median (middle quartile) is the middle value by definition. For the reference period, 50 percent of the flows are greater than the median, 50 percent are less than the median, 50 percent are between the upper and lower quartiles (in the normal range) 25 percent are greater than the upper quartile (above normal), and 25 percent are less than the lower quartile (below normal). Flow for the current month is then classified as; *above normal* if it is greater than the upper quartile, *in the normal range* if it is between the upper and lower quartiles, and *below normal* if it is less than the lower quartile. Change in flow from the previous month to the current month is classified as *seasonal* if the change is in the same direction as the change in the median. If the change is in the opposite direction of the change in the median, the change is classified as *contraseasonal* (opposite to the seasonal change). For example: at a particular index station, the January median is greater than the December median; if flow for the current January increased from December (the previous month), the increase is seasonal; if flow for the current January decreased from December, the decrease is contraseasonal.

*Flood frequency analyses* define the relation of flood peak magnitude to probability of occurrence or recurrence interval. *Probability of occurrence* is the chance that a given flood magnitude will be exceeded in any one year. *Recurrence interval* is the reciprocal of probability of occurrence and is the *average* number of years between occurrences. For example, a flood having a probability of occurrence of 0.01 (1 percent) has a recurrence interval of 100 years. *Recurrence intervals imply no regularity of occurrence;* a 100-year flood might be exceeded in consecutive years or it might not be exceeded in a 100-year period.

Statements about *ground-water levels* refer to conditions near the end of the month. The water level in each key observation well is compared with average level for the end of the month determined from the 30-year reference period, 1951-80, or from the entire past record for that well when only limited records are available. Comparative data for ground-water levels are obtained in the same manner as comparative data for streamflow. *Changes in ground-water levels,* unless described otherwise, are from the end of the previous month to the end of the current month.

Dissolved solids and temperature data for May are given for six stream-sampling sites that are part of the National Stream Quality Accounting Network (NASQAN). *Dissolved solids* are minerals dissolved in water and usually consist predominately of silica and ions of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulfate, chloride, and nitrate. *Disslolved-solids discharge* represents the total daily amount of dissolved minerals carried by the stream. *Dissolved-solids concentrations* are generally higher during periods of low streamflow, but the highest dissolved-solids *discharges* occur during periods of high streamflow because the total quantities of water, and therefore total load of dissolved minerals, are so much greater than at times of low flow.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
NATIONAL CENTER, STOP 419
RESTON, VIRGINIA 22092

OFFICIAL BUSINESS

Return this sheet to above address, if you do NOT wish to receive this material ☐, or if change of address is needed ☐ (indicate change, including ZIP code).

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF THE INTERIOR
INT 413

U.S. MAIL

# FIRST CLASS

SPECIAL PROCESSING DEPT NWC
MARCIA KOZLOWSKI
XEROX/UNIVERSITY MICROFILMS
ANN ARBOR MI 48106